Claims

We claim:

1. A computerized method of teaching spoken language skills comprising:
    a. Receiving a user utterance into a computer system;
    b. Analyzing the user utterance according to basic sound units;
    c. Comparing the analyzed user utterance and desired utterance so as to detect any difference between the basic sound units comprising the user utterance and the basic sound units comprising the desired utterance;
    d. Determining if a detected difference comprises an identifiable pronunciation error; and
    e. Providing feedback to the user in accordance with the comparison.
2. The method of claim 1, wherein determining includes garbage analysis that determines if the user utterance is a grossly different utterance than the desired utterance.
3. The method of claim 1, wherein analyzing (b) includes mapping between the basic sound units of the desired utterance and the basic sound units of the user utterance, and wherein an identifiable pronunciation error comprises a user utterance having at least one of the following characteristics:
    a. A basic sound unit of the user utterance, substantially the same as the corresponding basic sound unit of the desired utterance, that was produced differently but within an acceptance limit from the desired basic sound unit,
    b. A basic sound unit of the user utterance that is different from the corresponding basic sound unit of the desired utterance,

c. A basic sound unit of the user utterance that is not present in the corresponding sound unit of the desired utterance, or

d. A basic sound unit of the desired utterance that is not present in the corresponding sound unit of the user utterance.

4. The method of claim 1, wherein providing feedback includes providing the user with a description of the mispronunciation.

5. The method of claim 1, wherein said basic sound units are phonemes.

6. The method of claim 4, where the identified basic sound unit in the user utterance can be either a basic sound unit of the desired utterance language or a basic sound unit of the user's native language.

7. The method of claim 1, wherein said feedback includes presentation of at least part of the utterance text corresponding to the user utterance basic sound units with identified production error.

8. The method of claim 1, wherein said feedback includes grading of the basic sound units of the user utterance, and grading is performed in accordance with an *a priori* expected performance level.

9. The method of claim 1, wherein feedback is provided in an hierarchical way, where any level above the lowest one includes feedback for multiple clusters where each cluster is composed of multiple clusters of the lower level, and the lowest level includes feedback for the basic sound units.

10. The method of claim 1, wherein analyzing includes assigning a stress level for at least one basic sound unit and, after comparison, determining if a detected difference is an identifiable stress error.

11. The method of claim 1, wherein analysis includes mapping of intonation to basic sound units and, after comparison, determining if a detected difference comprises an identifiable intonation error.

12. A computer system that provides instruction in spoken language skills, the computer system comprising:

    a. an input device that receives a user utterance into the computer system;

    b. a processor that analyzes the user utterance according to basic sound units, compares the analyzed user utterance and desired utterance so as to detect any difference between the basic sound units comprising the user utterance and the basic sound units comprising the desired utterance, determines if a detected difference comprises an identifiable pronunciation error, and provides feedback to the user in accordance with the comparison.

13. The system of claim 12, wherein the system determines detected differences by including a garbage analysis that determines if the user utterance is a grossly different utterance than the desired utterance.

14. The system of claim 12, wherein the system analyzes the user utterance by mapping between the basic sound units of the desired utterance and the basic sound units of the user utterance, and wherein an identifiable pronunciation error comprises a user utterance having at least one of the following characteristics:

    a. A basic sound unit of the user utterance, same as the corresponding basic sound unit of the desired utterance, that was produced differently but within an acceptable distance from the desired basic sound unit,

    b. A basic sound unit of the user utterance that is different from the corresponding basic sound unit of the desired utterance,

c. A basic sound unit of the user utterance that is not present in the corresponding sound unit of the desired utterance, or

d. A basic sound unit of the desired utterance that is not present in the corresponding sound unit of the user utterance.

15. The system of claim 12, wherein the system provides feedback by providing the user with a description of the mispronunciation.

16. The system of claim 12, wherein said basic sound units are phonemes.

17. The system of claim 15, where the identified basic sound unit in the user utterance can be either a basic sound unit of the desired utterance language or a basic sound unit of the user native language.

18. The system of claim 12, wherein said feedback includes presentation of at least part of the utterance text corresponding to the user utterance basic sound units with identified production error.

19. The system of claim 12, wherein said feedback includes grading of the basic sound units of the user utterance, and grading is performed in accordance with an *a priori* expected performance level.

20. The system of claim 12, wherein the feedback is provided in a hierarchical manner, where any level above the lowest one includes feedback for multiple clusters where each cluster is composed of multiple clusters of the lower level, and the lowest level includes feedback for the basic sound units

21. The system of claim 12, wherein the analysis includes assignment of a stress level for at least one basic sound unit and, after comparing, determining if a detected difference comprises an identifiable stress error.

22. The system of claim 12, wherein the analysis includes mapping of intonation to basic sound units and, after comparison, determining if a detected difference comprises an identifiable intonation error.

5